A Cord Blood Transplant Recipient as a Deceased Organ Donor: Implications of Chimerism and Sample Source for HLA and ABO Typing

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WHY THIS CASE MATTERS

- After allogeneic hematopoietic stem cell transplantation (HSCT), peripheral blood may reflect the stem cell donor rather than the recovered organs.
- This can affect both HLA and ABO typing assignments used for deceased-donor evaluation and organ allocation.
- Alternative specimens may also contain mixed cellular populations.

CASE

24-year-old deceased organ donor

- Krabbe disease; cord blood transplantation (CBT) at age 5
- Death after encephalopathy and sepsis following burn injury
- Key concern: Does peripheral blood represent the organs in HLA and ABO typing?

TESTING STRATEGY

Historical 2007 HLA	Pre-CBT HLA records for both the CBT donor and the recipient (the deceased organ donor)
Peripheral blood	HLA + ABO serology + ABO genotype
Buccal swab	HLA + ABO genotype

HLA: LinkSēq real-time PCR with SureTyper
ABO genotype: LinkSēq ABO Genotyping and Subgrouping with SureTyper Blood

HLA FINDINGS

Historical, peripheral-blood, and buccal-swab typings were concordant at the loci available for comparison.

HLA-A	A1, A2
HLA-B	B8, B44
HLA-C	Cw5, Cw7
HLA-DR / DQ	DR4, DR17 / DQ2, DQ7
Added in deceased donor evaluation *	DQA1*03,05; DPA1*01,02; DPB1*01:01,04:01

*HLA typing from both peripheral blood and buccal swab samples matches

HLA assignment remained suitable for allocation

ABO DISCREPANCY AND GENOTYPING

Hospital serology
A positive
Initial report

→

OPO serology
Forward O
Reverse A
Discrepant

→

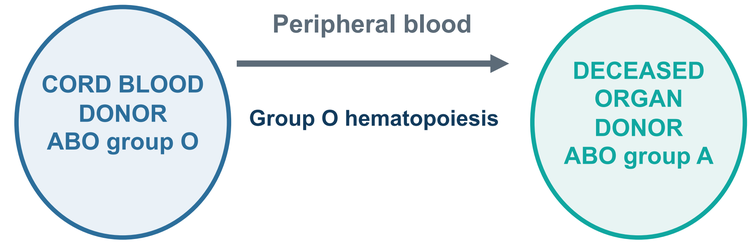
Allocation
Group AB
Unresolved in time

PERIPHERAL BLOOD
O.01.01 / O.02.01
CB donor-derived group O

BUCCAL SWAB
A1.01 + O.01.01 + O.02.01
Mixed recipient + CB donor DNA

KEY RESULT **Blood reflected CBT donor-derived group O; Buccal DNA retained the deceased donor-derived constitutional A1 allele, with mixed blood-derived O**

BIOLOGICAL INTERPRETATION



The three ABO alleles in buccal DNA indicate a mixed cellular specimen rather than a pure constitutional source.

Constitutional A1 retained in tissue-derived DNA

LESSONS FOR DECEASED DONOR TYPING

1. Confirm prior HSCT/CBT during donor history review.
2. Do not assume peripheral blood represents the recovered organs.
3. Compare historical HLA results with current blood and an alternate specimen.
4. Use molecular ABO genotyping when serology is discordant or biologically ambiguous.
5. Interpret alternative specimens cautiously, as tissue admixture may persist.

CONCLUSION

HSCT-associated chimerism can create clinically relevant HLA and ABO ambiguity in deceased-donor testing.`

History + specimen source + serology + molecular testing = accurate typing assignments